CLAIMS

1. (Currently amended) An aqueous acidic iron phosphorus bath comprising:

(A) at least one compound from which iron can be electrolytically deposited,

(B) hypophosphite ion, and

(C) a sulfur-containing compound selected from sulfoalkylated polyethylene imines, sulfonated safranin dye, and mercapto aliphatic sulfonic acids or alkali metal salts thereof.

2. (Original) The bath of claim 1 wherein the iron compound is selected from ferrous chloride, ferrous sulfate, ferrous fluoroborate, ferrous methane sulfonate, ferrous sulfamate and mixtures thereof.

3. (Currently amended) The bath of claim 1 wherein the ~~source of~~ hypophosphite ion is provided as hypophosphorus acid, an alkali metal hypophosphite salt, or a mixture thereof.

4. (Original) The bath of claim 1 wherein the sulfur-containing compound is a mercapto aliphatic sulfonic acid, an alkali metal salt thereof, or a mixture thereof.

5. (Currently amended) The bath of claim 1 wherein the ~~sulfur containing~~ sulfur-containing compound is represented by the formula

$$Y–S–R^1–SO_3X \qquad I$$

wherein X is H or an alkali metal, R^1 is an alkylene group containing from 1 to about 5 carbon atoms, Y is H, $S–R^1–SO_3X$, $C(S)NR_2''$, $C(S)OR''$ $C(NH_2)NR_2''$, or a heterocyclic group, and each R'' is independently H, or an alkyl group containing from 1 to about 5 carbon atoms.

6. (Currently amended) The electroplating bath of claim 1 ~~also~~ further comprising aluminum ions.

7. (Original) The bath of claim 1 wherein the pH is from about 0.5 to about 5.

8. (Original) The bath of claim 1 wherein the bath is free of complexing agents.

9. (Currently amended) The bath of claim 1 wherein the iron compound ~~source of ferrous ion~~ comprises ferrous sulfate and ferrous chloride.

10. (Currently amended) An aqueous acidic iron phosphorus electroplating bath comprising:

(A) from about 20 to about 120 grams per liter of ferrous ion,

(B) from about 0.2 to about 8 grams per liter of phosphorus, said phosphorus being supplied as hypophosphite ion, and

(C) from about 0.001 to about 0.5 grams per liter of sulfur present as a sulfur-containing compound selected from sulfoalkylated polyethylene imines, sulfonated safranin dye, and mercapto aliphatic sulfonic acids or alkali metal salts thereof.

11. (Original) The electroplating bath of claim 10 wherein the ferrous ion is present as at least one salt selected from ferrous chloride, ferrous sulfate, ferrous fluoroborate, ferrous methane sulfonate, ferrous sulfamate, and mixtures thereof.

12. (Currently amended) The electroplating bath of claim 10 wherein the ~~phosphorus is present as~~ hypophosphite ion is from hypophosphorus acid, an alkali metal hypophosphite salt, or mixtures thereof.

13. (Original) The electroplating bath of claim 10 wherein the sulfur-containing compound is a mercapto aliphatic sulfonic acid compound or salt thereof.

14. (Original) The plating bath of claim 10 wherein the sulfur containing compound is represented by the formula

$$Y–S–R^1–SO_3X \qquad I$$

wherein X is H or an alkali metal, R^1 is an alkylene group containing from 1 to about 5 carbon atoms Y is H, $S–R^1–SO_3X$, $C(S)NR_2''$, $C(S)OR''$ $C(NH_2)NR_2''$, or a heterocyclic group, and each R'' is independently H, or an alkyl group containing from 1 to about 5 carbon atoms.

15. (Currently amended) The electroplating bath of claim 10 wherein the bath ~~also~~ further comprises from about 0.1 to about 10 grams per liter of aluminum ions.

16. (Original) The plating bath of claim 10 wherein the bath has a pH of from about 0.8 to about 2.5.

17. (Original) The plating bath of claim 10 wherein the bath is free of complexing agents.

18. (Currently amended) A process for electrodepositing an iron-phosphorus alloy on a conductive substrate which comprises:

(A) providing ~~an acidic aqueous electroplating~~ the aqueous acidic iron phosphorus bath of claim 1, and

(B) effecting the electrodeposition of the alloy on the substrate through the use of said bath.

19. (Original) The process of claim 18 wherein the substrate is a cylinder of an internal combustion engine.

20. (Currently amended) A process for electrodepositing an iron-phosphorus alloy on a conductive substrate which comprises:

(A) providing ~~an acidic aqueous~~ the aqueous acidic iron phosphorus electroplating bath of claim 10, and

(B) effecting the electrodeposition of the alloy on the substrate through the use of said bath.

21-24. (Cancelled)